ECONOMIC SUPPORT PROJECT

Estimated Value of the Output of the Coal Mining Machinery Industry in the USSR in 1955

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FOREWORD

The objective of this report is to analyze the 2.5 billion ruble figure which the Soviets reported to be the gross output of the USSR coal mining machinery industry in 1955. To breakdown this figure, published quantitative production figures of coal mining machinery have been valued in ruble terms. For the majority of the items for which the Soviets give no production figures, estimates have been made of the volume of production, and their ruble values calculated. The 1 July 1955 wholesale prices of coal mining machinery in the Soviet handbook Materials and Equipment Used in the Coal Industry were used in estimating the value of the various types of coal mining machinery.

The paucity of production data and the difficulty of determining an average price for each type of coal mining machinery make these estimates subject to a considerable margin of error. Further refinement of these estimates should await the appearance of statistics on the quantity of production for a greater range of items of coal mining machinery than the Soviets have so far published.

This study is part of a larger ORR effort to determine the value of output of the entire machine building sector in the USSR, which in turn, contributes to ORR's study of Soviet economic growth--past, present, and future.

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SUMMARY

The USSR reported that the value of the gross output of the coal mining machinery industry in 1955 was 2.5 billion rubles. To analyze this figure, the value of 1955 production of those items of coal mining machinery for which the Soviets reported quantitative production figures--coal combines, coal cutters, rock loaders and electric mine locomotives-- was estimated. This estimate revealed that these major items of coal mining machinery constituted only 8.5 percent of the reported gross output of the coal mining machinery industry. Quantitative estimates were made for other important items on the basis of data on inventories, model distribution and partial production. The estimated value of these items approximated 60.3 percent of the gross output.

No data were available which permitted even crude estimates of quantitative production of winches and hoists, mine supports, ventilators, drills, and accessories. The value of these items and any addition to unfinished production was assumed to represent the remaining 31.2 percent of the gross output.

The total estimated value of the gross output of the coal mining machinery industry is shown in Table 1 below.

Table 1

Total Estimated Value of the Gross Output
of the Coal Mining Machinery Industry in 1955

	Ruble Value	Percent of Total
Equipment for which production data are available		
Coal combines	56,200,000	2.2
Coal cutters	14,000,000	0.6
Rock loaders	82,000,000	3.3
Electric mine locomotives	59,600,000	2.4
Subtotal	211,800,000	8.5
Equipment for which production data have been derived		
Conveyors	304,800,000	12.2
Mine cars	267,181,000	10.7
Tunnelling and heading combines	10,200,000	0.4
Coal cleaning equipment (maximum)	400,000,000	16.0
Construction machinery and miscellaneous equipment	400,000,000	16.0
Consumer items and equipment produced by mining machinery plants for other industries	125,000,000	5.0
Subtotal	1,507,181,000	60.3
Miscellaneous equipment and addition to unfinished production for which no estimates can be made	781,019,000	31.2
Total	2,500,000,000	100.0

I. Introduction

A mid-1955 Soviet source reported the overall value of the gross output* of the Soviet coal mining machinery industry to be over 2.5 billion rubles annually. 1/** At that time the industry consisted of 35 specialized coal mining machinery plants producing about 600 types of coal mining equipment. This group of 35 plants constituted a highly integrated coal mining machinery industry administratively subordinate to the Ministry of the Coal Industry USSR and produced equipment used in mine construction and development, as well as all types of coal extraction and coal cleaning machinery. Later in 1955, a new Ministry of the Construction of Coal Industry Enterprises USSR came into existence and assumed jurisdiction over 11 of the above-mentioned 35 plants. The significance of this development, insofar as this report is concerned, is that a separate breakdown of 460,385,000 rubles representing the value of the gross output for 1955 was reported for this group of plants. 2/ This value figure, although pinpointing a considerable segment of the 2.5 billion figure, is only of limited usefulness, because the product mix of these plants, while oriented toward shaft sinking and mine construction equipment, also included items produced elsewhere in the industry (mine cars, supports, pumps, winches). This factor precludes association of the 460 million ruble figure with mine construction equipment exclusively.

In the ensuing sections of this report, the 2.5 billion gross production figure is analyzed to determine its composition. Section II covers those items of equipment for which the Soviets issued quantitative production figures for 1955. Estimates have been made of the volume of production of each model known to have been in production during 1955 and an average value calculated for each model based on Soviet wholesale prices issued on 1 July 1955. Section III covers those items for which data on inventories or on production at specific plants permits approximations to be made of total national production. These estimates are then valued as in Section II. A number of items for which no data are available on which to base an estimate of production are included in Section IV. These items are assumed to comprise the residual portion of the 2.5 billion ruble figure.

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* The term "gross output" refers to the total volume of output (goods and services) in value terms produced in a given period. It includes all commercial production, all unfinished production, plants' own unused semi-manufactures, and all the tools, devices, materials, and spare parts manufactured by the plants of the industry in a given production period. Gross output is calculated in wholesale prices, actual or comparable. Repair services for other than the plants' own equipment are not included in the gross output of the coal mining machinery industry. The coal industry operates its own extensive repair facilities apart from coal mining machinery manufacture. The value of the gross output of these machinery repair plants is always reported separately.

** For serially numbered source references, see Appendix A.

No separate estimate has been made for the value of production of spare parts for coal mining machinery. Coal mining machinery plants generally produce only initial spares which are sold with a new machine. Coal face machinery, for example, is equipped with three of more sets of major spares when it leaves the plant. These spares are presumably included in the price of the machine. Spare parts for repairs are produced by the repair plants and shops of the coal mining trusts formerly subordinate to the Ministry of the Coal Industry (27 plants and 86 shops) and by the repair plants and shops of the former Ministry of Construction of Coal Industry Enterprises (41 repair establishments).* Since these enterprises are not part of the coal mining machinery industry, the spare parts, and the new equipment, which they produce would not be included in the 2.5 billion ruble figure.**

II. Estimates of the Ruble Value of Coal Mining Machinery for Which Production Data are Available

A. Coalface Machinery

Although coalface machinery is the most publicized of all the mining equipment, its ruble value constitutes a relatively small percentage (slightly over 6 percent) of the total value of gross output. Coalface machinery includes coal combines, coal cutters, and coal and rock loaders. It is the only category, with the exception of mine locomotives, for which quantitative production data for 1955 are available.

1. Coal Combines

The output of coal combines in 1955 totalled 731 units. Below is the breakdown by model and estimated ruble value:

* Since the industrial reorganization in 1957, these ministries no longer exist, and the repair enterprises are subordinate to the Regional Economic Councils, either directly or through coal or mine construction trusts.

** The gross output of these repair enterprises is sizeable, exceeding 1.4 billion rubles in 1956. More than half of this amount represented the value of production of coal mining equipment. The value of the output of the repair plants and shops of the coal mining trusts under the Ministry of the Coal Industry was 1,150,000,000 rubles of which 420,000,000, or nearly 37 percent was derived from repair services; 114,000,000 rubles, or about 12 percent from spare parts production; and 585,000,000 or about 51 percent from the manufacture of metal supports and miscellaneous equipment. 3/ The value of the output of the repair plants and shops of the Ministry of Construction of Coal Industry Enterprises for 1956 was 267,100,000 rubles of which 96,156,000 rubles, or 36 percent was from repair and spare parts production and 170,944,000, or 64 percent from the manufacture of metal supports and miscellaneous equipment. 4/

Table 2

Estimated Ruble Value of Coal Combine Production, 1955

Model a/	Number Produced	Price (per unit)	Total Value (in Rubles)
Donbass*	377	74,800	28,200,000
Gornyak	175	90,000	15,800,000
UKT	52	85,000**	4,400,000
UKMG	65	59,660	3,900,000
Shakhter	59	63,200	3,700,000
Others***	3	74,532	200,000
Total	731		56,200,000

a. 5/

2. Coal Cutters

Only two models of coal cutters were in regular production in 1955. No breakdown of production by model is available, but the prices on both models differ so slightly that they are both valued at the average price of 34,500 rubles.

Table 3

Estimated Ruble Value of Coal Cutter Production, 1955

Model	Number Produced	Price	Total Number of Cutters Produced	Average Price	Total Value
KMP-2	N.A.	34,600	405	34,500	14,000,000
PMG-2	N.A.	34,400			

*The 1955 valuation is based on the price of the Donbass-1 model.

**1 July 1956 price.

***Probably prototypes. Crude valuation is based on figure obtained by averaging the price of all models, which also happens to correspond closely to the price of the standard Donbass-1 model.

3. Rock Loaders

Although an overall production figure of 1,965 units for rock loaders* is reported, it is not absolutely certain that all of these machines were produced within the coal mining machinery industry. A popular loader, the MPR-6 (similar to EPM-3) for example, was produced at the time by the Ministry of Defense Industry, while other loaders used in coal mining were, and still are, produced by the ore mining equipment plant at Krivoy Rog. Another difficulty is the lack of data on the breakdown of loader models manufactured. A great variation exists in the price of rock-loaders -- 15,300 rubles for the small PML-5 model and 200,000 rubles for the highly specialized, powerful, PMU-1.

25X1B

The only concrete information on the number of specific types of loaders in production was obtained from [redacted] report which estimated the 1955 production of the EPM-1 loader at the Druzhkovka Toretsk Plant to be approximately 513 units, or slightly more than 26 percent of the total output of rock loaders. 6/ The Druzhkovka plant is known to specialize in the production of the above model and probably accounts for most of its output, which, however, does not preclude the possibility of small numbers of this type of loader being produced elsewhere in the industry, particularly because of its widespread use. Assuming that an additional 5 percent or 98 units of the overall output of rock loaders was devoted to the production of this machine by other plants, and that the Druzhkovka plant accounted for about 26 percent of the total output of rock loaders, the output of EPM-1 loader for 1955 is estimated to be about 611 units or slightly over 31 percent of the entire output of loaders in 1955.

The PMU-1 loader, which is used in steep headings, was developed and tested in mid-1955 and probably did not go into full series production until sometime in 1955. Considering the short time in production, and the fact that this machine is used in highly complex rather than general mining operations, it is unlikely that the PMU-1 accounted for more than 5 percent of the total output, or 98 units.

The pneumatic PML-5 rock loader, used almost exclusively in the seams where the use of electric power is restricted because of the fire hazard, is said to be produced in large numbers. The PPM (2, 3, and 4), referred to as a highly efficient machine, is also widely used in Soviet mines. Just what proportion of the output each one constituted in 1955 cannot be determined. Consequently, the remaining output of loaders,

* From Narodnoye khozyastvo SSSR v 1958 godu (National Economy of the USSR in 1958) Moscow, 1959, p. 235. U. This figure does not include coal loaders, which although still in production, have generally been superseded by rock loaders. The inventory of coal loaders has been steadily declining and production cannot be estimated.

(with the exclusion of 20 percent of the entire loader output which is assumed to have been produced outside the coal mining machinery industry) is divided equally between the two models, each valued at its listed price.

Table 4

Estimated Ruble Value of Rock Loader Production, 1955

Model	Estimated Number Produced	Price (per unit)	Total Ruble Value
EPM-1	611	24,350	14,900,000
PMU-1	98	200,000	19,600,000
PML-5	432	15,300	6,600,000
PPM (2, 3, 4)	431	95,000	40,900,000
Total	1,572*		82,000,000

B. Mine Locomotives

In 1955 electric mine locomotive production amounted to 1,816 units.** Recent Soviet sources indicate that only 18 percent of the Soviet mine locomotive inventory consists of 10-14 ton machines, the bulk of the inventory consisting of 7-8 ton units and a certain proportion of the 2-ton light duty locomotive. 7/ For lack of more definite information it is assumed here that the 1955 output of the 10-14 ton locomotive was about 15 percent of the total, or 272 units. The output of the 2-ton lightweight locomotive is assumed to be 20 percent, or 363 units, and of the 7-8 ton locomotive about 65 percent, or 1,181 units.

* Excluding the 393 assumed to be produced outside the industry

** In 1957 the inventory of mine locomotives consisted of 12,316 units of which 5,618 were of the trolley type and 6,698 of the storage battery type. The fact that the inventory of battery type locomotives was almost 20 percent higher than that of the trolley type, suggests a higher production rate for the battery type.

Table 5

Estimated Ruble Value of Electric Mine Locomotive Production, 1955

Weight (Tons)	Estimated Number Produced (Units)	Average Price* (Rubles)	Total Ruble Value
10-14	272	80,133	21,800,000
7-8	1,181	26,750	31,600,000
2	363	17,050	6,200,000
Total	1,816		59,600,000

Because of the fire hazard, trolley locomotives are confined to intake airways. The biggest weights are usually hauled by the 7-14 ton battery locomotives; the small 2-ton types are used for light duty and materials hauling. In estimating the ruble value of locomotives, weight, rather than type, is used as a criterion.

III. Estimates of the Ruble Value of Machinery Items for Which Production Data Have Been Derived

A. Conveyors

There has been a steady increase in the postwar inventory of conveyors of several thousand units per year. In 1955 the inventory of scraper conveyors increased over the 1954 inventory by 4,556 units. The inventory of belt conveyors increased by 978 units. The retirement rate of conveyors, is not known. The retirement rate for fixed capital of the coal industry is about 11 percent. 8/ This rate applied to certain types of mining equipment would undoubtedly be too high, but applied to conveyors, which are known to have a relatively short life, appears reasonable and may even be low.

The 1955 inventory of scraper conveyors was 28,705 units. Assuming that 11 percent or 3,158 units were retired, and adding to it the increment to the inventory of 4,556 units gives a rough production estimate of scraper conveyors of 7,714 units. Correspondingly, the inventory of belt conveyors in 1955 was 9,457 units. If 1,040 units were retired, the production of belt conveyors is estimated at 2,018 units.

* The average price was derived by averaging all the prices for a given weight locomotive.

Table 6

Estimated Ruble Value of Conveyor Production

Type	Number Produced (in units)	1955 Price	Total Ruble Value
Scraper conveyor	7,714	25,600*	197,000,000
Belt conveyor			
LKU-250**	202	102,800	20,800,000
Other types	1,816	47,900***	87,000,000
Total	9,732		304,800,000

B. Mine Cars

If Soviet plant production data are to be taken at face value, the output of mine cars in the USSR in 1955 could have been as high as 175,000 to 200,000 units per year./ The Kiselevsk Mining Machinery Plant alone was slated to bring up its production of mine cars in the 1951-1955 period first to 70,000 and ultimately to 100,000 units per year. 10/ The Uzlovaya Mining Machinery Plant was reported to have produced 18,000 large cars (2 to 2.5 tons) in 1955. 11/ The Druzhkovka Toretsk Plant, also known as a large producer of mine cars, is estimated to have produced 50,000 cars as early as 1951 12/ and probably increased its production of cars over that amount in 1955. Mine cars are also produced in considerable quantities at the Kutaisi "Gornyak" and the Krasnyy Luch plants and in varying quantities in a number of other mining machinery plants within and outside the USSR

* Average price obtained from averaging the prices of all scraper conveyor models in production in 1955. Price variations based on conveyor length for models SKT-6, SKT-6m and SKR-11 have been included in the averaging. Most conveyor models are about 100-120 meters (one meter 3.28 ft.) in length.

** This conveyor is used only in very steep seams. The 10 percent of output figure is based on arbitrary assumption that only a limited number of this model was produced.

*** Average price of all belt conveyor models, excluding the LKU-250.

/ The output of mine cars in 1951 was estimated by ORR at about 100,000 units. 9/

coal mining machinery industry.* An analysis of the inventory of mine cars tends to confirm the 200,000 production estimate. The inventory of mine cars increased from 366,900 units at the end of 1950 to 626,300 units by the end of 1955. 14/ Soviet estimates put the service life of a small car at about 4 years. 15/ Assuming a 25 percent retirement rate and an addition to inventory of about 65,000 cars annually, the production of mine cars for 1955 is estimated to be around 200,000 units.

Using the production estimate of 175,000 cars assumed to have been produced by the coal mining machinery plants, the value of the output of cars adds up to a considerable portion of the value of the overall gross output of the industry. The average price of a 2 ton and over car is estimated at 4,081 rubles.** If 15 percent of the output (based on the inventory ratio) were devoted to the production of the larger car, it can be valued at about 107,126,000 rubles. Computing the remaining output of 148,750 cars at an average price of 1,076 rubles, gives a figure of 160,055,000 rubles, making a grand total for all mine cars of 267,181,000 rubles.

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* Most of the Soviet cars are small, only one to 1.5 tons. Only 15 percent of the inventory consists of cars 2 to 2.5 tons or larger. The average for the Donets Basin is 1.08 tons; for Kizel, 1.37 tons; Karaganda, 1.41 tons; Pechora, 1.57 tons; and for the Kuznets Basin, 1.58 tons. 13/

** The average was derived by averaging the price of all models weighing over two tons. Although the "average price" used in this report for each type of car seems realistic, the estimated overall value of the output of mine cars appears inflated when compared with the available production and value of output data of plants. For example, the estimated value of the output of mine cars of the Kiselevsk plant (specialized producer of mine cars) exceeds by far the given total value of the gross output of this plant for the year. The total value of this output for 1955 is reported to be only 31,019,000 rubles. 16/ Assuming that the plant reached only the 70,000 unit production rate instead of the planned 100,000, and valuing the car output at the lowest price listed, which is 705 rubles, the total value of the mine car output (49,350,000) would still exceed the plants overall value of output by 18,331,000 rubles. Computing the output at an average price of 1,076 rubles would give a figure of 75,320,000 rubles, almost two and a half times the reported value for 1955. In case of the Uzlovaya plant, the total value of output for the year is given at 87,002,000 rubles. 17/ If the plant produced 18,000 large cars, as claimed, their value at the average price of 4,081 rubles would total 73,458,000 rubles, leaving only 13,544,000 rubles to account for the value of other important items that the plant is known to produce. These discrepancies cannot be reconciled at the present time without additional information and further study.

Table 7

Estimated Ruble Value of Mine Car Production, 1955

	Estimated Number Produced	Price (In rubles)	Total Ruble Value
2 to 2.5 ton and larger	26,250	4,081	107,126,000
One to 2 ton	148,750	1,076	160,055,000
Total	175,000		267,181,000

C. Tunnelling and Heading Combines

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Tunnelling and heading combines did not go into regular production until about 1952-53. [redacted] 25X1B In 1955 there were 17 Sh-BM-1 combines in operation throughout the USSR. The PK-2m heading combine was another model in production in 1955. The rest of the models in existence at the present time were then in the prototype stage. In 1955, the inventory of tunnelling and heading machines increased by 47 units which probably corresponds to the production rate, as no retirement can be assumed to have taken place.*

Table 8

Estimated Ruble Value of
Tunnelling and Heading Combine Production, 1955

	Estimated Number Produced	Price	Total Ruble Value
ShBM-1	10	459,000**	4,600,000
PK-2m	30	120,700	3,600,000
Prototypes (various types and sizes)	about 7		approx. 2,000,000
Total	47		10,200,000

* The average service life of the Donbass-1 combine is given at about 7 years. 18/ Tunnelling combines probably have a service life of at least 10 years.

** Handbook price. Another Soviet source lists the production cost of the ShBM-1 at 763,000 and 732,000 rubles. 19/

D. Coal Cleaning Equipment

Coal cleaning equipment includes a miltitude of items ranging from a 70 ruble cable castor to a 193,000 ruble drier. If only one of each of the items included in the range of coal cleaning equipment had been produced, the total value would amount to over 5,000,000 rubles. As in the case of the major coalface machinery, the major items in the coal cleaning product mix, on the basis of inventory figures, do not appear to constitute a very significant part of the probable total value of coal cleaning equipment.* In 1955, two coal mining machinery plants, frequently referred to in Soviet literature as those among the largest and most important in the industry, were producing coal cleaning equipment almost exclusively, supplying about 100 coal cleaning plants of the coal industry. 21/ Unfortunately, no reliable labor or wage data are available for these plants to be used in constructing an estimate of the overall value of output. Generally, the coverage given these plants makes them appear much larger than any of the plants in the construction machinery category of which two plants have a value of gross output reported at more than 99,000,000 rubles each. 22/ This factor, together with the fact that the two coal cleaning equipment plants are supplying such a large number of consumer plants, makes it seem reasonable to place the value of their joint output in 1955 between 250,000,000 to 400,000,000 rubles.**

* No production information on coal cleaning equipment is available, other than the fact that almost all of it is postwar. In 1956, the inventory of major coal cleaning machinery consisted of 2,000 screens, 650 crushers, 130 jigging machines, 100 pneumatic separators, 60 flotation machines, 200 centrifuges and 50 driers. 20/ For the purpose of extreme simplification and assuming no retirement taking place (with the possible exception of screens), the above data averaged over a 10 year period of 1946-56 indicate the production of 200 screens, 60 crushers, 13 jigging machines, 10 separators, etc., annually. The total value of this assumed output would add up to only about 11,000,000 rubles on the basis of the average price obtained by averaging the prices of products in question. Doubling or tripling the figure on the assumption that the 1955 production was greater than in the preceding years, would not appreciably change the overall estimate.

** Some coal cleaning equipment such as special ventilators, pumps, vacuum filters, filters, etc., and a considerable quantity of spare parts are also produced in repair plants and shops and are not included in this estimate.

E. Mine Construction Machinery and Miscellaneous Equipment

No individual estimates can be made of the different types of equipment produced by the eleven plants under the former Ministry of the Construction of Coal Industry Enterprises. Most of this equipment consisted of construction machinery including cranes, bucket hoists, excavators, ditch digging machines, special construction equipment used in the installation of concrete blocks, electric cableways, etc., fittings, and other metal structures. These plants also manufactured items that were produced by other coal mining machinery plants -- pumps, winches, mine cars, tunnelling combines, and mine supports. The total value of this output is given at 460,385,000 rubles. Assuming that approximately 60,000,000 of this total is contained in the figure allocated in this report for mine car production,* the value of the remaining output comes to about 400,000,000 rubles, or 16 percent of the overall value of 2.5 billion rubles.

F. Consumer Items and Equipment Produced by the Mining Machinery Plants for Other Industries

Most of the mining machinery plants are required to produce a limited number of consumer goods and selected items for other industries, such as wood-working tools, tractor spare parts, etc. The value of such production is arbitrarily set in this report at 5 percent of the total or 125,000,000 rubles.

IV. Miscellaneous Equipment for Which No Estimates of Production Can Be Made

A. Mine Hoists and Winches

The largest and heaviest mine hoists are produced outside the coal mining machinery industry, chiefly at the Novo-Kramatorsk and the Ural Machine Building plants. Smaller hoists, with the drum diameter of 2-3 meters, are produced at the Stalino 15th Anniversay of the LKSMU Plant. This plant is known to produce mine hoists for export to the European Satellites and Communist China and probably was the exporter of 10 coal mine hoists in 1955 valued at 2,382,000 rubles. 23/ No data are available on the production or inventory of these machines. Eight types of hoists appear to have been in production in 1955, ranging from 87,600 to 202,400 rubles in price, which indicates that they may be a significant element in the pricing of the overall output.

* Arbitrarily based on the possible share of the total value of the output of the Kiselevsk plant (total value 31,019,000 rubles) and the Uzlovaya plant (87,002,000 rubles) devoted to mine car production in 1955. As was previously pointed out, the low figures of the total gross value of output of both plants do not seem to correspond to the published production data on mine cars for these plants and to the value assigned to mine car production in this report.

Data on the output of winches are so scattered and incomplete that it would be futile to guess at their value. The price of winches ranges from 3,550 to 108,000 rubles, with one prototype costing as much as 250,000 rubles. In 1955, many of the winches were produced by the group of plants producing mine construction machinery. Part of their value is included in the value of the construction and miscellaneous equipment category.

B. Other

In addition to mine hoists and winches, there are many other products of the coal mining machinery industry for which the value of production cannot be estimated. No production data exist for pumps, drills, ventilators, lamps, and smaller tools and accessories, some of which individually are of low value, but collectively form a significant part of the total value. Quantative production data on large shaft sinking units, hydraulic mining equipment, mechanized mine supports and props* and a variety of other equipment are also lacking. Part of the value of this output (pumps, supports, etc.) is contained in the value of the construction machinery and miscellaneous equipment category. The total value of the mine hoists and miscellaneous items is assumed to equal the unaccounted for portion of the 2.5 billion rubles -- 781,019,000 rubles, a figure which seems reasonable for the aggregate value of such a large variety of items.**

V. Recapitulation of the Methodology Used in Estimating the Value of the Gross Output of the Coal Mining Machinery Industry in 1955

The total estimated breakdown of the reported 2.5 billion ruble value of the gross output of the coal mining machinery industry for 1955 is given in Table 1 (page 2).

* Although lumber is still the chief material used for supports in the Soviet mines, there has been a steadily increasing trend to the use of metal. In 1955, of the 3,356 faces suitable for metal propping, 1,117 were secured with metal props and supports as against only 123 in 1947 and 688 in 1950. 24/ No production data on these items are available, which are usually given in terms of tons, but they undoubtedly would represent a significant element in the overall valuation.

** This also includes any addition to unfinished production at the end of the year over the beginning of the year.

The general organization of this breakdown parallels that of the subsequent textual presentation. The first category, which includes coal combines, coal cutters, rock loaders, and electric mine locomotives, is estimated from published production data. Sufficient information on coal combines permitted production estimates to be made by model in Section II of this report. Less information was available on rock loaders and electric mine locomotives, so that estimates were developed from deductions concerning the possible model distribution within these categories. The total value of the equipment estimated on the basis of production data is 211,800,000 rubles, or about 8.5 percent of the 2.5 billion rubles.

The second category covers items for which only partial production data were available, and for which quantitative production estimates and/or value of production were derived. This group includes such important machinery items as conveyors, mine cars, and tunnelling and heading machines. Estimates of the value of conveyors and tunnelling machines were based on inventory and model data. A crude estimate of the value of mine car output was made from conflicting production data and the reported value of the output of producing plants. The value of the coal cleaning equipment was approximated from scattered inventory data and the probable value of output of producing plants. Construction machinery and equipment was estimated with fair certainty by aggregating the data on the value of the output of the individual plants engaged in the production of such equipment and making allowances for other items produced by them. Consumers goods comprise the remainder of this category. The total value of the items in the second category is estimated to be 1,507,181,000 rubles or 60.3 percent of the gross output of the coal mining machinery industry.

The last category includes a variety of items such as mine hoists, winches, pumps, drills, ventilators, lamps, etc. as well as unfinished production, whose value defies estimation because of the complete lack of production data. The total value of these items is assumed to constitute the still unaccounted for portion of the 2.5 billion rubles, or 781,019,000 rubles, which is 31.2 percent of the total gross output.

APPENDIX A

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

Source of Information	Information
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organization; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

All sources in this report are evaluated RR 2 unless otherwise indicated.

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1. Mekhan. uglya, No 6, 1955, Moscow, p. 18. U.
2. Stroitel'stvo predpriyatiy ugol'noy promyshlennosti SSSR (Construction of the Coal Industry Enterprises of the USSR), Moscow, 1957, p. 362. U. (hereafter referred to as Stroitel'stvo predpriyatiy).
3. Ugol'naya promyshlennost' SSSR 1917-1957 (The Coal Industry of the USSR 1917-1957), Moscow, 1957, p. 531-532. U. (hereafter referred to as Ugol'naya promyshlennost').
4. Stroitel'stvo predpriyatiy (2, above), p. 370.
5. Ugol'naya promyshlennost' (3, above), p. 226.
6. [redacted] 25X1B
7. Mekhanizatsiya tyazhelykh i trudoyemkikh rabot, No 9, 1958, Moscow, p. 4. U.
8. Pavlov, P. Snashivaniye i amortizatsiya osnovnykh fondov (Depreciation and Amortization of Fixed Capital), Moscow, Gosfinizdat, 1957, p. 155. U.
9. CIA. CIA/RR 21, The Coal Mining Equipment Industry of the USSR, 27 May 53, p. 169. S.
10. Ugol'naya promyshlennost' (3 above), p. 516. U.
11. Stroitel'stvo predpriyatiy (2, above), p. 360. U.
12. CIA/RR 21, p. 169. (9 above)
13. Ugol'naya promyshlennost' (3, above), p. 184. U.
14. Ugol'naya promyshlennost' SSSR (The Coal Industry of the USSR), statistical handbook, Moscow, Ugletekhizdat, 1957, p. 106 and 122. U. Eval. Doc.
15. Kabayanskiy, Kh. S. Osnovnyye voprosy gornoy statistiki (Basic Questions of Mining Statistics), Moscow-Kharkov, Ugletekhizdat, 1953, p. 245. U.
16. Stroitel'stvo predpriyatiy (2, above), p. 362.

17. Ibid.

18. Vestnik mashinostroyeniya, No 4, 1958, Moscow, p. 68. U.

19. Mekhanizatsiya tyazhelykh i trudoyemkikh rabot. No 5, 1958. p.22. U.

20. Ugol'naya promyshlennost' (3, above), p. 499.

21. Ibid. p. 491.

22. Stroitel'stvo predpriyatiy (2, above), p. 362.

23. Vneshnyaya torgovlya souza SSSR za 1956 god: statisticheskiy obzor (Foreign Trade of the USSR for 1956: statistical collection), 1958, Moscow, p. 13, U. Eval. Doc.

24. Ugol'naya promyshlennost' SSSR (13, above), p. 106 and 122. U.